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EXAMINER	
CARTER III, ROBERT E	

ART UNIT	PAPER NUMBER
2629	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/518,410	IKEDA, HIROSHI	
	Examiner	Art Unit	
	ROBERT E. CARTER III	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,7-10 and 13-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,7-10 and 13-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of species 1 in the reply filed on 02/05/2009 is acknowledged.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 2, 7-10, and 13-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding the independent claims 2, 7, 15, and 16, the term "scan inverting circuit" is defined by the operational language "a scan inverting circuit for inverting the direction of a horizontal scan along a row on said display panel in each frame or each field"

However, figures 2B and 3 of the disclosure, and page 9, lines 6-12 of the specification defines the scan inverting circuit as a simple inverter which inverts the horizontal direction scan signal output from the scan driving circuit.
The claimed operation of inverting the direction of the horizontal scan along a row (as opposed to inverting the horizontal direction scan signal) is actually performed by the signal driving circuit as explained on page 15, lines 12-15 of the specification.

It is clear from the specification, that the scan inverting circuit is simply an inverter, and that the claimed operation of the scan inverting circuit is actually performed by the signal driving circuit.

Therefore, for the purposes of examination, the examiner has separated the scan inverting circuit and the claimed operation, and defined a new part called a **direction circuit**, which can be considered as part of the signal driving circuit.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 2, 7-10, and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukumoto et al. (Japanese Application # 07-244267, Disclosed in IDS submitted on 12/17/2004, copy also submitted on this date) in view of Guha et al. (US Patent # 5,739,545), Harris et al. (US Patent # 5,115,228) and Jacobsen et al. (US Patent # 6,232,937) and further in view of Liang et al. (US Publication # 2003/0035198).

As for claim 2, Fukumoto et al. (Figs. 1, 3) discloses:

A display apparatus comprising:

a display panel (1) *with a first side* (Top side of display in figure 1) *and a second side* (bottom side of display in figure 1),

wherein the display panel provides a display that can be observed from either side [0004];

a pair of liquid crystal shutter means (3, 4) *disposed in such a manner as to sandwich said display panel* [0012]

display control means (Fig. 3) for displaying a first image which can be seen from the one side of the display panel and a second image which can be seen from the other side of the display panel [0005]; *and*

liquid crystal shutter control means (7) *for opening and closing said pair of liquid crystal shutter means in synchronism with the operation of said display control means in such that they do not open simultaneously, wherein said pair of liquid crystal shutter means are opened and closed by said liquid crystal shutter control means such that said first and second image can be observed as the original display on each side of said display panel [0015-0016].*

Fukumoto et al. does not teach the display panel having a plurality of picture elements.

In the same field of endeavor (i.e. EL displays) Guha et al. (Figs. 3, 8B) discloses:

a display panel (Fig. 8B) *with a first side* (top side of display panel in Fig. 8B) *and a second side* (bottom side of display panel in Fig. 8B)*, having a plurality of imaging devices* (50, 98', 100', 102', 104') *which emit light from both sides* (Col. 3, lines 25-29) *and are arranged in a two-dimensional matrix* (Col. 5, lines 36-40, 54-57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel of Fukumoto et al. with the display having a plurality of picture elements of Guha et al., to reduce size and improve speed of operation (Guha et al., Col. 5, lines 57-59).

Fukumoto et al. as modified by Guha et al. does not teach a display control means which displays a first image on one side in one frame and a second image on the other side in the next frame, or an LC shutter control means which opens and closes the pair of shutters for each frame.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

display control means (20, 26, 28, 34) *for displaying a first image in every frame or every field which can be seen from the one side of the display panel and a second image which can be seen from the other side of the display panel in every other frame or every other field* (Col. 3, line 50 – Col. 4, line 4); *and*

liquid crystal shutter control means (22, 24) *for opening and closing said pair of liquid crystal shutter means in synchronism with the operation of said display control means in each frame scan or each field scan such that they do not open simultaneously, wherein said pair of liquid crystal shutter means are opened and closed by said liquid crystal shutter control means such that said first and second image can be observed as the original display on each side of said display panel* (Col. 3, line 46 – Col. 4, line 4), *and*

wherein said display control means (20, 26, 28, 34) *comprises* **a scanning** *circuit* (42, 44) … *which display a first display from the first side of the display panel and a second display from the second side of the display panel* (Col. 3, line 46 – Col. 4, line 4)*; and*

said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from said **scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. as modified by Guha et al., with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means comprising a scan inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the scan inverting circuit merely inverts the horizontal scan signal (Page 9, lines 6-12)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan driving circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and adding an inverter to the output of the scanning circuit is well known, the obvious combination of the references teaches:

said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from said scan inverting circuit.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means inverting the direction of a horizontal scan along a row on said display panel in each frame or each field.

In the same field of endeavor (i.e. display scan drivers) Jacobsen et al. (Fig. 2C) discloses:

wherein said display control means (112) *comprises a* **direction** *circuit for inverting the direction of a horizontal scan along a row on said display panel in each frame or each field.* (Col. 8, lines 60-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the direction inverting technique taught in Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. does not teach the shutters being able to open and close for a single imaging device.

In the same field of endeavor (i.e. displays using LC shutters) Liang et al. discloses an electrophoretic display using an overlaid LC shutter to switch each imaging device to a black color [0011 – 0012].

Since Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches a pair of liquid crystal shutters sandwiching a display, which open and close for a plurality of imaging devices (the entire display), and Liang et al. teaches a display overlaid with an LC shutter capable of opening and closing for a single imaging device, the obvious combination of the references teaches a pair of LC shutters which open and close for a single imaging device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shutters in Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al., with the shutters which can open and close for a single imaging device in Liang et al. to improve color saturation and contrast ratio (Liang et al., [0014]).

Combining Fukumoto et al., Guha et al., Harris et al., Jacobsen et al., and Liang et al. would meet the claim limitations:

a pair of liquid crystal shutter means disposed in such a manner as to sandwich said display panel for switching on and off each respective imaging device;

As for claim 7, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1)*, said display panel being capable of display on both surfaces, namely a first surface and a second surface, thereof* [0004]*, first shutter means* (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012],

and control means comprising display control means (Fig. 3) *for performing display control such that a first display observed from said first surface side and a second*

display observed from said second surface side can be viewed as the same display [0005]*, and shutter control means* (7) *for controlling the opening and closing of shutters such that the display picture... on said second surface side are screened by said second shutter means upon said first display, and the display picture…on said first surface side are screened by said first shutter means upon said second display, wherein said display control means, while switching the display period of said first display and said second display, performs display control such that said first display and said second display have a relationship where they are substantially mirror images of each other upon viewing said first display and said second display from either said first surface side or said second surface side with said shutters open* [0015-0016],

Fukumoto et al. does not teach the display panel having a plurality of picture elements.

In the same field of endeavor (i.e. EL displays) Guha et al. (Figs. 3, 8B) discloses:

A display panel (Fig. 8B) *having a plurality of picture elements* (50, 98', 100', 102', 104') *that perform display based on an input signal* (Col. 5, lines 36-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel of Fukumoto et al. with the display having a plurality of picture elements of Guha et al., to reduce size and improve speed of operation (Guha et al., Col. 5, lines 57-59).

Combining Fukumoto et al. and Guha et al. would meet the claim limitations:

shutter control means for controlling the opening and closing of shutters such that the display picture elements on said second surface side are screened by said second shutter means upon said first display, and the display picture elements on said first surface side are screened by said first shutter means upon said second display

Fukumoto et al. as modified by Guha et al. does not teach the display period being a single frame.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

wherein said display period, in which said first display and said second display are switched is a unit scan period based on a single field unit period or a single frame unit period based on a horizontal scan unit period (Col. 3, line 50 – Col. 4, line 4)*; and said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from* **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. as modified by Guha et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26).

Combining Fukumoto et al., Guha et al., Harris et al., would meet the claim limitations:

said first and second shutter means being capable of opening and closing for a plurality of picture elements;

said display panel being capable of display on both surfaces, namely a first surface and a second surface, thereof, using a picture element at a selected location;

Since Fukumoto et al. as modified by Harris et al. teaches a first and second shutter means capable of opening and closing for the entire display, and Guha et al. teaches a display having a plurality of picture elements, the obvious combination of the references teaches a first and second shutter means capable of opening and closing for a plurality of picture elements (the entire display).

Since Fukumoto et al. as modified by Harris et al. teaches a display panel capable of display on both surfaces, and Guha et al. teaches a display having a plurality of picture elements, the obvious combination of the references teaches a display panel capable of display on both surfaces using a picture element at a selected location.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means comprising a scan inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the scan inverting circuit merely inverts the horizontal scan signal (Page 9, lines 6-12)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan driving circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and adding an inverter to the output of the scanning circuit is well known, the obvious combination of the references teaches:

said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means inverting the direction of a horizontal scan along a row on said display panel in each frame unit period or each field unit period

In the same field of endeavor (i.e. display scan drivers) Jacobsen et al. (Fig. 2C) discloses:

said display control means (112) *comprises a* **direction** *circuit for inverting the direction of a horizontal scan along a row on said display panel in each frame unit period or each field unit period* (Col. 8, lines 60-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel and display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the direction inverting

technique taught in Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

As for claim 8, Harris et al. teaches:

wherein said shutter control means controls the opening and closing of shutters in synchronism with the switching of said display period by said display control means (Col. 2, lines 44-48).

As for claim 9, Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches all the limitations of claim 7.

Fukumoto et al. as modified by Guha et al., Harris et al. does not teach the control means comprising a memory circuit or a signal driving circuit.

Jacobsen et al. teaches:

wherein said control means comprises:

A memory circuit (107, 108, 109) *for storing a data signal in each horizontal scan unit period of said picture element based on said input signal* (Col. 8, lines 34-38)

said **direction** *circuit for inverting the scan order in each said horizontal scan unit period* (Col. 8, lines 60-62).

A signal driving circuit (44a, 44b, 44c, 44d) *for outputting a data signal to said display panel* (Col. 7, lines 37-39) *in order to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and said inverted scan signal outputted from said scan inverting circuit* (Col. 8, lines 34-62,

the inverted scan signal is always applied to the scan lines regardless of which side of the display is being driven).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the direction inverting signal driving circuit of Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. does not teach a signal inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the signal inverting circuit merely inverts the horizontal scan inverted signal output from the scan inverting circuit (Page 9, lines 24-27)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan driving circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and adding an inverter to the

output of the scanning circuit is well known, the obvious combination of the references teaches:

A signal inverting circuit for inverting the inverted scan signal outputted from said scan inverting circuit.

Fukumoto et al. as modified by Guha et al., and Jacobsen et al. does not teach a shutter switching circuit.

Harris et al. teaches:

a shutter switching circuit (26, 28) *for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from* **a scanning** *circuit* (42, 44)*, wherein, upon alternatively displaying either said first display or said second display outputted from said signal driving circuit in each said horizontal scan unit period, the display surface side on which display has not been selected is screened alternatively by said first or second shutter means* (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means of Fukumoto et al. as modified by Guha et al., with the shutter switching circuit of Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26).

As stated in the rejection of claim 7 above, placing an inverter at the output of the scanning circuit of Harris is well known. Therefore Harris et al. teaches:

a shutter switching circuit for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from said scan inverting circuit.

As for claim 10, Fukumoto et al. teaches:

wherein said first and second shutter means are formed by liquid crystal panels disposed on said first display surface and said second display surface, respectively, in an opposing manner [0006], [0012].

As for claim 13, Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches all the limitations of claim 7.

Fukumoto et al. as modified by Guha et al., Harris et al. does not teach the control means comprising a memory circuit or a signal driving circuit.

Jacobsen et al. teaches:

wherein said control means comprises:

a memory circuit (107, 108, 109) *for storing a data signal in each scan unit of said picture element based on said input signal* (Col. 8, lines 34-38);

a scan driving circuit (46a, 46b) *for providing a scan driving signal to said display panel in the scan order of each said scan unit* (Col. 7, lines 39-47);

a signal driving circuit (44a, 44b, 44c, 44d) *for changing the output order of said image signal received from a memory circuit in each scan order, while outputting to the display panel an image signal that is used to perform a first image display by said scan order and a second image display by the inverted scan order based on an inverted scan signal at different times, based on said data signal stored in said memory circuit and the scan driving signal outputted from the scan driving circuit* (Col. 8, lines 34-62, the inverted scan signal is always applied to the scan lines regardless of which side of the display is being driven).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the memory circuit, scan driving circuit, and direction inverting signal driving circuit of Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. does not teach a signal inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the signal inverting circuit merely inverts the horizontal scan inverted signal output from the scan inverting circuit (Page 9, lines 24-27)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan inverting circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and adding an inverter to the output of the scanning circuit is well known, the obvious combination of the references teaches:

a signal inverting circuit for inverting the inverted scan signal outputted from said scan inverting circuit;

Fukumoto et al. as modified by Guha et al., and Jacobsen et al. does not teach a shutter switching circuit.

Harris et al. teaches:

a shutter switching circuit (26, 28) *for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from* **a scanning** *circuit* (42, 44)*, wherein, upon alternatively displaying either said first display or said second display based on said image signal outputted from said signal driving circuit in each said scan unit, the display surface side on which display has not been selected is screened alternatively by said first or second shutter means* (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means of Fukumoto et al. as modified by Guha et al., with the shutter switching circuit of Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26).

As stated in the rejection of claim 7 above, placing an inverter at the output of the scanning circuit of Harris is well known. Therefore Harris et al. teaches:

a shutter switching circuit for controlling the opening and closing of said first shutter means and said second shutter means based on an output signal from said scan inverting circuit.

As for claim 14, Fukumoto et al. teaches:

wherein said first and second shutter means are formed by liquid crystal panels disposed on said first display surface and said second display surface, respectively, in an opposing manner [0006], [0012].

As for claim 15, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1), *said display panel being capable of display on both surfaces, namely a first surface and a second surface that is opposite to said first surface, thereof* [0004],

first shutter means (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012]

control means comprising display control means (Fig. 3) *for performing display control of a first display observed from said first surface side and a second display, which is different from said first display, observed from said second surface side, and shutter control means for controlling said shutter means such that a regular image can be observed from both surfaces of said display panel, wherein the control of the opening and closing of shutters are performed such that the display picture… on said second surface side are screened while transmitting the display picture…on said first surface side by said second shutter means upon said first display, and such that the display picture…on said first surface side are screened while transmitting the display picture…on said second surface side by said first shutter means upon said second display* [0015-0016],

Fukumoto et al. does not teach the display panel having a plurality of picture elements.

In the same field of endeavor (i.e. EL displays) Guha et al. (Figs. 3, 8B) discloses:

A display panel (Fig. 8B) *having a plurality of picture elements* (50, 98', 100', 102', 104'), *comprising at least a first picture element* (50) *displaying toward a first display side and toward a second side of the display panel* (Col. 3, lines 25-29), *and that perform display based on an input signal* (Col. 5, lines 36-57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel of Fukumoto et al. with the display having a plurality of picture elements of Guha et al., to reduce size and improve speed of operation (Guha et al., Col. 5, lines 57-59).

Combining Fukumoto et al. and Guha et al. would meet the claim limitations:

wherein the control of the opening and closing of shutters are performed such that the display picture elements on said second surface side are screened while transmitting the display picture elements on said first surface side by said second shutter means upon said first display, and such that the display picture elements on said first surface side are screened while transmitting the display elements on said second surface side by said first shutter means upon said second display

Fukumoto et al. as modified by Guha et al. does not teach the LC shutter control means for displaying a regular image on both sides of the display simultaneously.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

shutter control means (22, 24) *for controlling said shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel* (Col. 3, line 46 – Col. 4, line 4),

said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal shutter means in Fukumoto et al. as modified by Guha et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26).

Combining Fukumoto et al., Guha et al., and Harris et al. would meet the claim limitations:

first shutter means and second shutter means disposed on said first surface side and said second surface side, respectively, that are capable of opening and closing for a plurality of picture elements; and

said display panel being capable of display on both surfaces, namely a first surface and a second surface that is opposite to said first surface, thereof, using a picture element at a selected location;

Since Fukumoto et al. as modified by Harris et al. teaches a first and second shutter means capable of opening and closing for the entire display, and Guha et al. teaches a display having a plurality of picture elements, the obvious combination of the references teaches a first and second shutter means capable of opening and closing for a plurality of picture elements (the entire display).

Since Fukumoto et al. as modified by Harris et al. teaches a display panel capable of display on both surfaces, and Guha et al. teaches a display having a plurality of picture elements, the obvious combination of the references teaches a display panel capable of display on both surfaces using a picture element at a selected location.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means comprising a scan inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the scan inverting circuit merely inverts the horizontal scan signal (Page 9, lines 6-12)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan driving circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response

to an output from a scanning circuit, and adding an inverter to the output of the scanning circuit is well known, the obvious combination of the references teaches:

said shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means inverting the direction of a horizontal scan along a row on said display panel in each frame unit period or each field unit period

In the same field of endeavor (i.e. active matrix display drivers) Jacobsen et al. (Fig. 2C) discloses:

said display control means (112) *comprises a* **direction** *circuit for inverting the direction of a horizontal scan along a row on said display panel in each frame or each field* (Col. 8, lines 60-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel and display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the direction inverting technique taught in Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

As for claim 16, Fukumoto et al. teaches:

A display apparatus comprising: a display panel (1) *having a first display surface and a second display surface and capable of display from both said first display surface and said second display surface* [0004],

first shutter means (3) *and second shutter means* (4) *disposed on said first surface side and said second surface side, respectively* [0012],

control means comprising display control means (Fig. 3) *for performing display control of a first display observed from said first display surface side and a second display, which is different from said first display, observed from said second display surface side* [0005]*, and liquid crystal shutter control means* (7) *for controlling said first and second shutter means such that a regular image can be observed from both surfaces of said display panel by screening the display picture…on said second display surface side while transmitting the display picture…on said first display surface side by said second shutter means upon said first display, and by screening the display picture…on said first display surface side while transmitting the display picture…on said second display surface side by said first shutter means upon said second display* [0015-0016].

Fukumoto et al. does not teach the display panel having a plurality of display elements.

In the same field of endeavor (i.e. EL displays) Guha et al. (Figs. 3, 8B) discloses:

A display apparatus comprising: a display panel (Fig. 8B) *having a first display surface* (top side of display panel in Fig. 8B) *and a second display surface* (bottom side of display panel in Fig. 8B)…said display panel having a plurality of display elements (50, 98', 100', 102', 104')*;*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display panel of Fukumoto et al. with the

display having a plurality of picture elements of Guha et al., to reduce size and improve speed of operation (Guha et al., Col. 5, lines 57-59).

Combining Fukumoto et al. and Guha et al. would meet the claim limitations:

liquid crystal shutter control means (7) *for controlling said first and second shutter means such that a regular image can be observed from both surfaces of said display panel by screening the display picture elements on said second display surface side while transmitting the display picture elements on said first display surface side by said second shutter means upon said first display, and by screening the display picture elements on said first display surface side while transmitting the display elements on said second display surface side by said first shutter means upon said second display*

Fukumoto et al. as modified by Guha et al. does not teach the LC shutter control means for displaying a regular image on both sides of the display simultaneously.

In the same field of endeavor (i.e. double sided displays) Harris et al. discloses:

liquid crystal shutter control means (22, 24) *for controlling said liquid crystal shutter means such that a regular image can be observed simultaneously from both surfaces of said display panel* (Col. 3, line 46 – Col. 4, line 4),

said liquid crystal shutter control means controls the switching of the opening and closing of said pair of liquid crystal shutter means in response to an output from **a scanning** *circuit* (42, 44), (Col. 2, lines 44-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means and liquid crystal

shutter means in Fukumoto et al. as modified by Guha et al. with the operation of the ones in Harris et al, to allow display of images on both sides of the display simultaneously (Harris et al., Col. 2, lines 20-26)

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means comprising a scan inverting circuit.

However, as defined in Figures 2 and 3 of the Applicant's disclosure and pages 9 and 10 of the specification, the scan inverting circuit merely inverts the horizontal scan signal (Page 9, lines 6-12)

The examiner takes Official Notice that inverters in signal paths of display drivers are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the scan driving circuit of Fukumoto et al. as modified by Guha et al. and Harris et al. by adding an inverter to the output, to correct phase and timing of the scan signal.

Since Fukumoto et al. as modified by Guha et al. and Harris et al. teaches a liquid crystal shutter control means which opens and closes the LC shutters in response to an output from a scanning circuit, and adding an inverter to the output of the scanning circuit is well known, the obvious combination of the references teaches:

said liquid crystal shutter control means controls the switching of the opening and closing of said first and second shutter means in response to an output from said scan inverting circuit.

Fukumoto et al. as modified by Guha et al. and Harris et al. does not teach the display control means inverting the direction of a horizontal scan along a row on said display panel in each frame unit period or each field unit period

In the same field of endeavor (i.e. active matrix display drivers) Jacobsen et al. (Fig. 2C) discloses:

said display control means (112) *comprises a* **direction** *circuit for inverting the direction of a horizontal scan along a row on said display panel in each frame or each field* (Col. 8, lines 60-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display control means in Fukumoto et al. as modified by Guha et al. and Harris et al. with the direction inverting technique taught in Jacobsen et al., to improve usability (Jacobsen et al., Col. 8, lines 50-58).

Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. does not teach the shutters being able to open and close for a single display element.

In the same field of endeavor (i.e. displays using LC shutters) Liang et al. discloses an electrophoretic display using an overlaid LC shutter to switch each pixel to a black color [0011 – 0012].

Since Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al. teaches a pair of liquid crystal shutters sandwiching a display, which open and close for a plurality of display elements (the entire display), and Liang et al. teaches a display overlaid with an LC shutter capable of opening and closing for a single display element,

the obvious combination of the references teaches a pair of LC shutters which open and close for a single display element.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shutters in Fukumoto et al. as modified by Guha et al., Harris et al., and Jacobsen et al., with the shutters which can open and close for a single picture element in Liang et al. to improve color saturation and contrast ratio (Liang et al., [0014]).

Combining Fukumoto et al., Guha et al., Harris et al., Jacobsen et al., and Liang et al. would meet the claim limitations:

first shutter means and second shutter means disposed on said first surface side and said second surface side, respectively, that are capable of opening and closing for each said display element;

As for claim 17, Harris et al. teaches:

wherein the display control means (20, 26, 28, 34) *of said display panel* (10) *and said shutter means* (16, 18) *are controlled by the same circuit* (34).

As for claim 18, Fukumoto et al. teaches:

A terminal apparatus comprising the display apparatus according to claim 2 (Paragraphs [0020-0021], Fig. 3).

As for claim 19, this claim is identical to claim 13, and therefore is rejected in the same manner as claim 13.

Response to Arguments

Applicant's arguments filed on 02/05/2009 have been fully considered but they are not persuasive.

Regarding the 35 U.S.C. 112, first paragraph rejection of claims 2, 7-10 and 13-19, Applicant argues:

"Sharp Corporation, the assignee of the present application, produces a large number of types of display modules which have an input for a horizontal display direction signal. Applicant provides herewith an example product specification for a display module having such a horizontal display direction signal. The example product specification is for an LCD display, rather than a two-sided electroluminescent display panel of the present invention. The example is provided for purposes of showing what is meant by a display capable of receiving a horizontal display direction signal. The example display has an R/L input for receiving a horizontal display mode select signal. Associated resulting images are provided in Note 4-2.

The Office Action states that it is not possible for the row driver to perform the function of "inverting the direction of a horizontal scan along a row on said display panel in each frame or each field." The Office Action goes on to state that the function must be performed by a circuit associated with the signal driver.

Applicant submits that the assumptions made in the Office Action are incorrect. As disclosed in the present specification, the display panel of the present invention has an input port for receiving a horizontal direction scan signal. The horizontal direction scan signal is a signal input to the display panel to specify the "direction" of horizontal scan."

The Examiner agrees and never disputed that it is possible to use some sort of direction signal to invert the direction of a horizontal scan and thereby invert an image as shown in the Sharp Corporation document provided. What the examiner asserts is impossible is for the row driver to perform this operation. Whatever direction signal is used to invert the direction of the horizontal scan MUST be input to the signal driver, because only the signal driver is capable of inverting the direction of the horizontal scan. The document provided does not show where the "horizontal display modes select signal" is applied, so it does not prove that it is possible for a row driver to invert the direction of the horizontal scan.

The scan driving circuit 13 of Fig. 2 is understood to be the row driver which provides the row driving signals to the rows of the display. This understanding is based on three factors:

1) scan driver is a common term in the art for a row driver.

2) Fig. 2 shows the inverted scan signal hsi being applied to the side of the display panel, which is the standard position for a row driver.

3) The non-elected embodiment of Fig. 6 discloses an identically named scan driving circuit 50 which is described as a row driver connected to row lines on page 15, lines 2-11 of the specification.

Therefore, the scan inverting circuit is applied to the row driver and rows of the display, not the signal driver and data lines, making it impossible for the scan inverting circuit to perform the function of inverting the direction of the horizontal scan.

The only function the scan inverting circuit could possibly perform is inverting the direction the VERTICAL scan (top to bottom or bottom to top), making the image on the display appear either right side up or upside down respectively.

Applicant further argues:

"The Office Action alleges that the scan inverting circuit 15 of the present invention is defined as a simple inverter which inverts the horizontal direction scan signal output from the scan driving circuit.

Applicant submits that the scan inverting circuit is disclosed as inverting the horizontal direction scan signal. However, the scan inverting circuit 15 also ensures that a horizontal direction scan inverted signal is provided to the display panel each frame and provides an appropriate interface for connecting to the display panel."

However, Applicant fails to cite any figures or lines from the specification to support the assertion that the scan inverting circuit does more than invert the horizontal direction scan signal. Therefore the Examiner maintains that the scan inverting circuit is a simple inverter.

Applicant further argues:

"The Office Action also provides a new name of "direction circuit." Applicant submits that although "direction circuit" appears to describe a function performed by the scan inverting circuit, "direction circuit" is not the term disclosed in the present specification. Applicant requests that the term "scan inverting circuit" be maintained."

However, as shown in the response to arguments above, the scan inverting circuit cannot perform the claimed functionality, and further is simply an inverter. Therefore a new component must be created and assigned the claimed functionality for purposes of the art rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT E. CARTER III whose telephone number is (571)270-3006. The examiner can normally be reached on 9AM - 5:30PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 571-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R.E.C./

/Richard Hjerpe/
Supervisory Patent Examiner, Art Unit 2629